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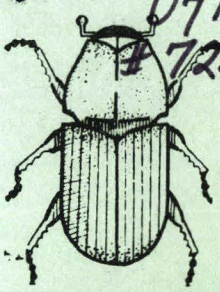

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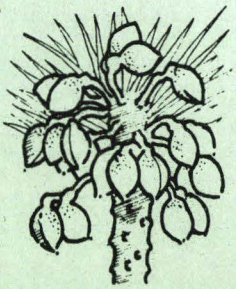

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EVALUATION OF BARK BEETLE INFESTATIONS ON COOK MOUNTAIN, ASHLAND DISTRICT, CUSTER NATIONAL FOREST, MONTANA

by

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ABSTRACT

The bark beetle infestation in ponderosa pines defoliated by pine looper, *Phaeoura mexicanaria* (Grote) on Cook Mountain was resurveyed in 1971. Most of the surviving defoliated trees have "greened up" appreciably. Bark beetle activity was greatly reduced. The red turpentine beetle, *Dendroctonus valens* LeConte, was the only bark beetle observed killing green trees.

INTRODUCTION

A serious bark beetle epidemic occurred in 1969 and 1970 in ponderosa pine stands severely defoliated by the looper, *Phaeoura mexicanaria* (Grote), on Cook Mountain, Ashland District, Custer National Forest, Montana. The primary bark beetle involved was the six-spined engraver, *Ips calligraphus* (Germar), although the pine engraver, *Ips pini* (Say), and the red turpentine beetle, *Dendroctonus valens* LeConte, were also common. These beetles have seldom been damaging on the Ashland District. The six-spined engraver has been reported only once previously in the Northern Region, following extensive winter damage.[2/]

1/ Respectively, Entomologist and Biological Technician, Forest Insect and Disease Branch.

2/ Tunnock, Scott. Personal communications, 1970.

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In the fall of 1970, an evaluation was conducted to assess the impact of bark beetles on the weakened trees (Dewey et al. 1971).[3/] That survey showed a high incidence of bark beetle attack and a strong attraction of the beetles to the severely defoliated trees. A followup evaluation was conducted during the week of November 8, 1971, with the following objectives:

1. Determine the trend of the beetle infestation.

2. Determine the number of current beetle killed trees.

3. Evaluate the reliability of the 1970 cruise by remeasuring stems/acre, infested trees/acre, total infested trees, etc.

METHODS

The evaluation was conducted in the same manner in 1971 as in 1970,[3/] with the following modifications:

1. In 1971, trees with diameters at breast height (d.b.h.) of less than 5 inches were not measured, whereas in 1970, trees 2 inches d.b.h. and up were recorded.

2. In 1971, a Spiegel-Relaskop was used to measure basal area. A wedge prism was used in 1970.

The evaluation consisted of a variable plot, 10-factor basal area cruise of the 1,920-acre area. Cruise lines were spaced 20 chains apart with plots located at 5-chain intervals along the lines. All trees within each plot were measured for d.b.h., height, and severity of defoliation (negligible, partial, complete). Each plot tree was examined for attack by bark beetles.

Because no defoliation occurred in 1971, tree defoliation was based on 1969 and 1970 damage. Bark beetle attacked trees were not separated as to beetle species or year of attack. A beetle killed tree may have been killed in 1969, 1970, or 1971.

3/ Dewey, Jerald E., William M. Ciesla, and Hubert E. Meyer, 1971. Evaluation of an engraver beetle *Ips calligraphus* (Germar), following pine looper defoliation on the Ashland District, Custer National Forest, Montana. Report No. 71-5, 7 pp., U.S. Department of Agriculture, Forest Service, Region 1, Division of State and Private Forestry, Missoula, Montana.

Undoubtedly some of the smaller trees were killed outright by the defoliation and were invaded by beetles. However, because we could not distinguish these, they were considered beetle killed.

Data was computer analyzed by modifying the Region 1 Sale Cruise Program.

RESULTS AND DISCUSSION

A total of 220 trees were measured on 32 plots in 1971. This gave a projected value of 180,700 total stems of 5 or more inches d.b.h. for the infested area. Of these, 74,088 (38.6 per acre) have been killed by bark beetles.

These values differ significantly from the corresponding 1970 figures when compared directly. Much of the reason for this is that 2-, 3-, and 4-inch diameter trees were measured in 1970 but only trees 5 inches and above were measured in 1971. When trees less than 5 inches are deleted from the 1970 data, results are relatively comparable (Table 1). The differences then may be attributable to sampling error.

Table 1.--Status of bark beetle activity, Cook Mountain, Ashland District, Custer National Forest--1970-71

Year	Bark beetle killed trees	Bark beetle killed trees /acre	Non-beetle infested trees	Non-beetle infested trees/acre	Total stems	Total stems /acre
1970	138,396	72.1	302,768	157.7	441,164	229.8
1970 1/	120,217	62.6	106,517	55.5	226,734	118.1
1971	74,088	38.6	106,612	55.6	180,700	94.2

1/ 1970 data deleting 2-, 3-, and 4-inch diameter trees.

No 1971 looper defoliation was detected in the study area, and bark beetle activity was greatly reduced from 1970. The only bark beetle observed killing trees was the red turpentine beetle. No brood of *Ips* sp. was found in the sample trees. The evaluation was made late enough that some of the overwintering *I. pini* may have left the trees to overwinter in the duff. *I. calligraphus* brood should have been in the trees if it was present. From these findings it appears the *Ips* sp. populations have returned to endemic levels. The red turpentine beetle is still quite active in the area but it is expected that it will again become endemic when the trees regain their predefoliation vigor.